

Claims

1. Insulation material element of mineral fibers, bound with a binding agent, soluble in a physiological milieu, in form of an insulation material plate or to a insulation material sheet rolled up as a roll and separable into insulation material plates as a portion of a system, prepared for clamped assembly of insulation plates between beams, such as roof rafters, **characterized in that** the composition of the mineral fibers of the insulation material element features a alkali/earth alkali relation of < 1 and that their fiber structure is determined by an average geometric fiber diameter of $\leq 4 \mu\text{m}$, by a gross density in the range of 8 to 25 kg/m³ and a portion of the binding agent referred to the fiber mass of the insulation material element in the range of 4% to 5,5 weight %.
- 10 2. Insulation material element according to claim 1, **characterized in that** said binding agent is an organic binding agent.
- 15 3. Insulation material element according to claim 1 or 2, **characterized in that** the binding agent, referred to the fiber mass of the insulation material sheet, is in the range of 4,5 to 5 weight %.
- 20 4. Insulation material element according to one of the preceding claims, **characterized in that** its gross density is in the range of 8 to 14 kg/m, preferably 11 to 14 kg/m³, especially approximately 13 kg/m³, and the insulation material element features a thermal conducting capacity corresponding to thermal conductivity group 040, according to DIN 18165 or similar.
- 25 5. Insulation material element according to one of the preceding claims, **characterized in that** their gross density is in the range of 18 to 25 kg/m³, preferably 19 to 24 kg/m³, especially 23 kg/m³, and the insulation material element features a thermal conducting capacity corresponding to the thermal conductivity group 035, according to DIN 18165.
- 30 6. Insulation material element assembled between beams, such as roof rafters, without additional internal lining, according to one of the preceding claims, **characterized in that** it features a fire resistance category of at least EI 30, according to EN 113501.
7. Insulation material element according to one of the preceding claims, **characterized in that** the roll up process of the mineral fiber felt, rolled up in form of a roll, is accomplished free of a prior treatment, eventually free of a fulling process.

8. Insulation material element according to claim 7, **characterized in that** the wound up roll of the mineral fiber felt is compressed pursuant to a compression ratio of 1:3 until 1:8, preferably 1:4 until 1:6.

5 9. Insulation material element according to one of the preceding claims, **characterized in that** upon said section, markings are provided as cutting aids, featured at least on one roll surface.

10 10. Insulation material element according to one of the preceding claims, **characterized in that** the mineral fibers of the insulation material element, as far as their solubility in a physiological milieu is concerned, correspond to the requirement of European Guideline 97/69/EG and/or the requirements of the German Dangerous Products Norm, Section IV, Nr.22.

15 11. Insulation material element according to one of the preceding claims, **characterized in that** said mineral fibers of the insulation element are produced by internal centrifugation in the centrifuging basket process, with a temperature at the centrifuging basket of at least 1.100 ° C.

12. Insulation material element according to one of the preceding claims, **characterized in that** it features a fusion point according to DIN 4102, Part 17, of ≥ 1.000 ° C.

13. Insulation material element according to one of the preceding claims, **characterized by** the following ranges of chemical composition of mineral fibers in weight %:

<chem>SiO2</chem>	39 – 55 %	preferably	39 – 52 %
<chem>Al2O3</chem>	16 – 27 %	preferably	16 – 26 %
<chem>CaO</chem>	6 – 20 %	preferably	8 – 18 %
<chem>MgO</chem>	1 – 5 %	preferably	1 – 4,9 %
<chem>Na2O</chem>	0 – 15 %	preferably	2 – 12 %
<chem>K2O</chem>	0 – 15 %	preferably	2 – 12 %
<chem>R2O</chem> (<chem>Na2O</chem> + <chem>K2O</chem>)	10 – 14,7 %	preferably	10 – 13,5 %
<chem>P2O5</chem>	0 – 3 %	especially	0 – 2 %
<chem>Fe2O3</chem> (Iron total)	1,5 – 15 %	especially	3,2 – 8 %
<chem>B2O3</chem>	0 – 2 %	preferably	0 – 1 %
<chem>TiO2</chem>	0 – 2 %	preferably	0,4 – 1 %
Other	0 – 2,0 %		

14. . Insulation material element according to one of the preceding claims, **characterized in that** the fiber structure of the insulation material element is respectively free of beads, meaning the bead portion is < 1%.

15. System for clamping insulation material elements between rafters of a building, in
5 particular rafters of a roof, characterized by insulation material elements with the features of one or several of the preceding claims, being aligned and clamped with a clamping felt between adjacent beams.